

## Chapter 4: Network Layer

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- ```

graph LR
    s((s)) -- 1 --> a((a))
    s -- 5 --> b((b))
    a -- 2 --> c((c))
    a -- 2 --> b
    a -- 1 --> d((d))
    b -- 2 --> d
    c -- 3 --> d
    c -- 1 --> e((e))
    d -- 2 --> e
  
```

- Diagram illustrating a network flow problem with 12 nodes (A, B, C, D, E, F, G, H, I, J, K, L) and their associated costs. The nodes are arranged in a grid-like structure with connections between them. The costs are listed in a table below the diagram.
- | To | A  | I  | H  | K  |
|----|----|----|----|----|
| A  | 0  | 24 | 20 | 21 |
| B  | 12 | 36 | 31 | 28 |
| C  | 25 | 18 | 19 | 36 |
| D  | 40 | 27 | 8  | 24 |
| E  | 14 | 7  | 30 | 22 |
| F  | 23 | 20 | 19 | 40 |
| G  | 18 | 31 | 6  | 31 |
| H  | 17 | 20 | 0  | 19 |
| I  | 21 | 0  | 14 | 22 |
| J  | 9  | 11 | 7  | 10 |
| K  | 24 | 22 | 22 | 0  |
| L  | 29 | 33 | 9  | 9  |

### **Chapter 5: Transport Layer**

1. Explain in detail the services offered by Transport Layer.
2. Explain the features of UDP and also explain UDP Header in detail.
3. The following is a dump of a UDP header in hexadecimal form:

06 32 00 0D 00 1C E2 17

What is the

- (a) Source port number
  - (b) Destination port number
  - (c) Total length of the UDP
  - (d) Length of the data
4. Explain TCP Segment Header in detail with a neat diagram.
  5. The following is a dump of a TCP header in hexadecimal format:  
00CD0018 00000EF1 00000D5D 502200D1 01BF0010
    - (a) What is the source port number?
    - (b) What is the destination port number?
    - (c) What is the sequence number?
    - (d) What is the acknowledgment number?
    - (e) What is the length of the header?
    - (f) What is the type of segment?
    - (g) What is the window size?
  6. Compare TCP and UDP.
  7. Explain different types of TCP Timers.
  8. Explain Berkeley Sockets in detail.

### **Chapter 6: Application Layer**

1. Explain Domain Name System (DNS) in detail.
2. Write a short note on: SMTP Protocol
3. Write a short note on: Telnet
4. Write a short note on: DHCP Protocol